

Claims

We claim:

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1. A device at an embroidery frame for a sewing machine, the device comprising an inner frame and an outer frame, between which inner and outer frames a hose is arranged, said hose being expandable through pressurization, whereby a textile material intended for embroidering is arranged to be clamped between said hose and said outer frame as well as tensioned over an area of the textile material intended for embroidering through pressurization of said hose after manual assembly of said inner frame and said outer frame and whereby said hose is arranged to through initial pressurization expand in an upper part of said hose and thereby clamp the textile material between said upper part of said hose and said outer frame as well as to through continued pressurization continue to expand in said upper part and in a lower part of said hose in a direction towards said outer frame and thereby impart on the textile material a tensioning, wherein the wall of said hose in thickness and shape is designed to, through pressurization, initially expand across said hose in said upper part and, through continued pressurization, continue to expand across said hose in said lower part.
2. The device according to claim 1, wherein said hose comprises at least one crease in at least one of an upper wall and a lower wall.
- 25 3. The device according to claim 2, wherein said upper wall of said hose in a transverse direction of said hose comprises at least one wave-shaped crease with a first crest of a wave having a first height in an unexpanded state and said lower wall of said hose in a transverse direction of said hose comprises at least one wave-shaped crease with a second crest of a wave having a second height in an unexpanded state.
- 30 4. The device according to claim 3, wherein said second height is substantially higher than said first height.
- 35 5. The device according to a claim 2, wherein a thickness of said upper wall is substantially thinner than a thickness of said lower wall.
6. The device according to claim 1, wherein a wall of said hose intended to bear on said outer frame comprises a recess at an inner circumference of said hose.

7. The device according to claim 1, wherein said inner frame at an outer circumference has an upper flange extending in a horizontal direction towards an intended location of said outer frame and a lower flange extending in a horizontal direction towards an intended location of said outer frame and wherein a recess intended for said hose is located between said upper flange and said lower flange.

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8. The device according to claim 7, wherein said hose comprises at least one crease in at least one of an upper wall and a lower wall

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9. The device according to claim 7, wherein said upper flange and said lower flange are wedge-shaped in a horizontal direction towards an intended location of said outer frame and wherein the thickness of said upper flange and said lower flange respectively is decreasing in a direction towards an intended location of said outer frame.

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10. The device according to claim 7, wherein an end of said lower flange at an outer circumference of said inner frame is chamfered originating from an upper side of said lower flange and towards a lower side of said lower flange in a downward direction and towards an inner circumference of said inner frame.

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11. The device according to claim 1, wherein said outer frame at an inner circumference comprises a flange extending at a lower side of said outer frame in a horizontal direction towards an intended location of said inner frame, a surface inclining from an upper side of said outer frame in a downward direction towards said flange and towards an outer circumference, and a recess formed in a transition from said inclining surface to said flange, whereby said flange has a longer extension in a horizontal direction towards an intended location of said inner frame than the inclining surface.

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12. The device according to claim 11, wherein said hose comprises at least one crease in at least one of an upper wall and a lower wall.

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13. The device according to claim 11, wherein an end of said flange of said outer frame at the inner circumference of said outer frame is chamfered originating from an upper side of said flange and towards a lower side of said outer frame in a downward direction and towards an intended location of said inner frame.

14. The device according to claim 13, wherein said end of said flange of said outer frame is designed to fit for bearing against an end of a lower flange at an outer circumference of said inner frame, which end is chamfered originating from an upper side of said lower flange and towards a lower side of said lower flange in a downward direction and towards an inner circumference of said inner frame.

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15. The device according to claim 1, wherein said outer frame at an inner circumference comprises a flange extending at a lower side of said outer frame in a horizontal direction towards an intended location of said inner frame, a shoulder extending at an upper side of said outer frame in a horizontal direction and a recess formed in a transition from said shoulder to said flange, whereby said flange has a longer extension in a horizontal direction towards an intended location of said inner frame than said shoulder.

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16. The device according to claim 15, wherein said hose comprises at least one crease in at least one of an upper wall and a lower wall.

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17. The device according to claim 15, wherein an end of said flange of said outer frame at the inner circumference of said outer frame is chamfered originating from an upper side of said flange and towards a lower side of said outer frame in a downward direction and towards an intended location of said inner frame.

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18. The device according to claim 17, wherein said end of said flange of said outer frame is designed to fit for bearing against an end of a lower flange at an outer circumference of said inner frame, which end is chamfered originating from an upper side of said lower flange and towards a lower side of said lower flange in a downward direction and towards an inner circumference of said inner frame.

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19. The device according to claim 1, wherein a cross-section of said inner frame in a horizontal direction is substantially thicker than a cross-section of the outer frame in a horizontal direction.

20. The device according to claim 1, wherein said inner frame and said outer frame are rectangular.

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21. A method for clamping and tensioning a textile material in an embroidery frame for a sewing machine comprising an inner frame, an outer frame and a hose arranged between said inner frame and said outer frame, which hose is expanded

through pressurization and is pressurized initially such that it expands in an upper part, whereby the textile material is clamped between said upper part of said hose and said outer frame and said hose is thereafter further pressurized such that it is expanded in a lower part, whereby the textile material is tensioned in a direction towards said outer frame, wherein said hose is pressurised initially such that the shape of said hose is rendered to change across said hose in said upper part and is thereafter further pressurized such that the shape of said hose is rendered to change across said hose in said lower part.

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10 22. The method according to claim 21, wherein said hose comprising at least one
crease in a transverse direction of said hose in an upper wall and at least one
crease in a transverse direction of said hose in a lower wall is initially pressurized
such that the at least one crease in a transverse direction of said hose in said
upper wall is straightened, whereby said hose is expanded in said upper part and
the textile material is clamped at said upper part of said hose between a wall of
said hose and an inclining surface at an inner circumference of said outer frame,
and said hose is thereafter further pressurised such that the at least one crease in
said lower wall of said hose is straightened, whereby a lower part of said hose is
expanded into a recess in an inner circumference of said outer frame and the
textile material is tensioned in a direction towards said outer frame along a flange
of said outer frame.

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25 23. The method according to claim 21, wherein said hose comprising at least one
crease in a transverse direction of said hose in an upper wall and at least one
crease in a transverse direction of said hose in a lower wall is initially pressurized
such that the at least one crease in said upper wall is straightened, whereby said
hose is expanded in said upper part and the textile material is clamped at said
upper part of said hose between a wall of said hose and a shoulder extending in a
horizontal direction at an upper side of said outer frame, and said hose is
thereafter further pressurized such that the at least one crease in said lower wall
of said hose is straightened, whereby a lower part of said hose is expanded into a
recess in an inner circumference of said outer frame, the textile material is folded
around a corner of said shoulder at a recess in an inner circumference of said
hose and the textile material is tensioned in a direction towards said outer frame
along a flange of said outer frame.

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24. A device at an embroidery frame for a sewing machine, the device comprising:
an inner frame;

an outer frame; and
an expandable hose arranged between the inner frame and the outer frame, the
hose comprising a first portion and a second portion, wherein the first portion and
the second portion are differentially expandable;
5 wherein the inner frame, the outer frame, and the hose are operative to retain a
textile material arranged between the hose and the outer frame and to apply
tension to the textile over an area of the frame.

25. The device according to claim 24, wherein the first portion of the hose and the
10 second portion of the hose have different wall thicknesses, thereby making the
first portion and the second portion differentially expandable.

26. The device according to claim 24, wherein the hose comprises at least one crease
15 in at least one of an upper wall and a lower wall, thereby making the first portion
and the second portion differentially expandable.

27. The device according to claim 26, wherein the upper wall of the hose comprises
20 at least one wave-shaped crease extending in a transverse direction of the hose,
and wherein the lower wall of the hose comprises at least one wave-shaped
crease extending in the transverse direction of the hose.

28. The device according to claim 24, wherein the first portion of the hose and the
second portion differentially change shape in response to pressurization, thereby
making the first portion of the hose and the second portion of the hose
25 differentially expandable.

29. A device at an embroidery frame for a sewing machine, the device comprising:
an inner frame;
an outer frame; and
30 an expandable hose arranged between the inner frame and the outer frame;
wherein the inner frame, the outer frame, and the hose are operative to retain a
textile material arranged between the hose and the outer frame and to apply
tension to the textile over an area of the frame.

35 30. A method for clamping and tensioning a textile material in an embroidery frame
including an inner frame, an outer frame and a hose arranged between the inner
frame and the outer frame, the method comprising:
arranging a textile material between the hose and one of the inner frame and the

outer frame;
expanding a first portion of the hose; and
expanding a second portion of the hose.

5 31. The method according to claim 30, wherein the first portion of the hose is an upper part of the hose.

32. The method according to claim 30, wherein the textile material is clamped between the first portion of the hose and the outer frame.

10 33. The method according to claim 30, wherein expanding the second portion of the hose tensions the textile material in a direction towards the one of the inner frame and the outer frame.

15 34. The method according to claim 30, wherein the hose comprises at least one crease in an upper wall and extending in a transverse direction of the hose and at least one crease in a lower wall and extending in a transverse direction of the hose, wherein the hose is expanded through pressurization and initial pressurization of the hose straightens the at least one crease in the upper wall, whereby the hose is expanded in the upper part and the textile material is clamped between the upper part of the hose and the outer frame, and wherein further pressurization of the hose straightens the at least one crease in the lower wall of the hose, whereby the lower part of the hose expands towards the outer frame and the textile material is tensioned in a direction towards the outer frame.

20 35. The method according to claim 30, wherein the hose comprises at least one crease in an upper wall and extending in a transverse direction of the hose and at least one crease in a lower wall and extending in a transverse direction of the hose, the hose is expanded through pressurization and initial pressurization of the hose straightens the at least one crease in the upper wall, whereby the upper part of the hose is expanded and the textile material is clamped between the upper part of the hose and the outer frame, and wherein further pressurization of the hose straightens the at least one crease in the lower wall of the hose, whereby the lower part of the hose is expanded into a recess in an inner circumference of said outer frame, whereby the lower part of the hose expands towards the outer frame and the textile material is tensioned in a direction toward the outer frame.

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